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ABSTRACT

This review of studies comparing early childhood education models focuses on the trends and problems of this kind of research. The 8 "qualitative" studies reviewed, all pertain to aspects of instructional theory centering around teacher-child interaction. In the 19 empirical studies discussed, a dichotomy between "structured and unstructured environments" was commonly utilized, but relevant definitions varied widely across studies. It is argued that the real issue is being masked: the comparison of small group-individual training sessions versus naturalistic classroom-whole group instruction. Language training appears to be the dominant area of training being reported, but there is insufficient discussion of language-cognition relationships and possible maturational aspects of language development. Research conclusions have been inconsistent regarding gains by low socioeconomic level children in relation to higher socioeconomic groups, lending uncertainty to the quantifiable nature of these gains. Comparison studies are criticized for their global use of crucial terms (i.e., model), and for their biases, as reflected in the opinion-laden reporting of data and observations. Finally, it is suggested that the trend toward competition among models (i.e., "finding differential effects") be reversed so that evaluation can be based on manipulation of parameters within each model. (DP)

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Trends and Problems in Comparison Studies of Early Childhood Education Models

Bette Hanson

PS 007350

During the decade which followed the beginning of Head Start classes throughout the United States, educators and the public became sensitized to questions of cognitive development and, believing knowledge of the effects of environmental influence upon that development to be possible, by means of experimental research attempted scientific predictions and explanations of expected effects. However, a most perplexing situation arose when the expected effects did not materialize--not, at least, in any clear-cut and startling significant way. The beginning specific question "How can we arrange the best environmental setting for the disadvantaged child?"[1] evolved to the more general "Are some models better for some children?"

Countless studies attest to the reflective and rational interpretations of data, data which was collected and analyzed in the hope of implementing programs which would have a positive effect on young children in their day-to-day schooling. But, with stunning finality, the massive Head Start Planned Variation research can be interpreted as finding that 'implementation' of any program with any children is a phenomenon of such complexity as to raise again that profound "first question" Pauline Sears and Edith Dowley asked as early as 1963: "whether changes are observed in children's behavior in association with specific teacher behaviors."[2] It is important to notice that this question

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is prior to assuming that changes are due to specific teacher behaviors since the measurement and statistical treatment of variables does not necessarily constitute justification, much less confirmation, for a causal argument as to the teacher-child interaction effect. In citing causes of changes in intelligence and achievement, as measured by tests, educators were saying ~~in a very general way that for a given event there are some conditions sufficient~~ for the occurrence of that event. It is to the discovery of these conditions that we shall turn in attempting to discuss trends and problems across a selection of comparison studies of early childhood education models. But first a brief reference to the extant literature which has attempted to get at the nature of early childhood education research problems through generalizing and arriving at some things common to all models.

Along with the astounding number of new programs,[3] often labelled 'models,' created since the inception of Head Start are concurrent, repeated attempts at evaluations which analyze and compare an ensemble of programs in the belief that emergent findings would add to an understanding of educational intervention for young children. The eight comparative evaluation studies considered in this paper (see page 15) are a rich, provocative source of insightful information into the program implementation of early childhood education theory and the differing concepts of its empirical research methodology. From a historical, socio-political viewpoint, program models may be seen as one of many schooling reforms intended to reintegrate and stabilize a culture adjusting to new social forces. Fruitful comparative evaluation studies of early childhood education models have traditionally been in the mode of either qualitative studies which discuss aspects in an attempt to define a set of criterial attributes for some set

of curricular events or empirical studies, which are presumed to go a step further by offering scientific prediction and explanation of the curricular events by means of ex post facto statistical analysis and/or description.

Gordon's "An Instructional Theory Approach to the Analysis of Selected Early Childhood Programs" is a comprehensive example of the characteristic qualitative study. As can be seen in the tables on pages 26-27 taken from Gordon's study, programs are sorted (according to the rhetoric of the program sponsor) into pupil, goal, and instructional situation characteristics, thus providing a model of a transactional network emphasizing instructional theory which is a subset within curriculum theory.

With differing purposes, all eight qualitative comparative studies reviewed in this paper are concentrating within Gordon's instructional theory framework. Thus, a reading of the Maccoby and Zellner book reveals the position that educational philosophy leads to a view of psychological theory which defines the learning process. Implications derived from the learning process suggest that classroom environment in terms of motivation and incentives has consequences for the child's self-esteem. According to Maccoby and Zellner, the teacher is the crucial point of integration, determining via the transmission process whether the program sponsor's purposes will be observable at the operational level. Cazden's analysis suggests that teacher-child interaction, a process variable, is the necessary practice to focus on if tests are to measure program outcomes. Mayer explains differences in instructional techniques as involved in an interaction based on the concept of structure: The more a program emphasizes a particular interaction (teacher-child, child-material, child-child), the more sequencing is built into the nature of the interaction. Lay & Dopyera suggest the need for a revision of comparative dimensions in which constructs

are relatively content and/or value free, and they identify eleven constructs which fall within situational characteristics, such as density, complexity, sequencing, contrast, scope, controllability. Both Parker & Day and Kamii compare preschool curricula on child development principles. Kamii formulates program evaluations from the point of view of socio-emotional, perceptual-motor, and cognitive objectives. From a different perspective, Parker & Day combine "the degree to which formal theory in child development influences the curriculum conceptualization" and "the degree to which the empirical research literature influences curriculum conceptualization" and conceive of a continuum of possibilities "ranging from a conceptualization grounded in a theoretical position which has strong empirical support, to one that ignores both theoretical systems and empirical literature in its formulation." This point of view is also taken by Gordon in his discussion of congruency:

> Any instructional theory should be congruent with the existing empirical data. Although all six programs [compared in Gordon's study] claim an empirical base, it is not at all clear at this time that all elements of each program are congruent with the data. . . . None of the programs seems to be incongruent with empirical data; the problem is that many of their ideas are unrelated to any known data and the data do not necessarily exist.

Stodolsky explains the general finding that structured programs produce greater I.Q. gains as an offshoot of homogeneous treatment with the corollary being "The more control one gains over treatment either through experimental manipulation or empirical description, the more likely that the outcome can be related to specified treatments." Of interest is her assertion that the child's activity pattern is the area for the treatment descriptor.

Not only do all of these qualitative studies pertain to aspects of instructional theory centering around teacher-child interation which was

properly pointed to by Cazden as a process variable, but there is another consistency in the use of the portmanteau dichotomy of structure-unstructured. However, the defining attributes of the teaching-learning process and of the structured-unstructured dimension are not identical across studies and no reason is given as to why we might expect the point at which interaction and structure meet to be of some differential value.

The most striking similarity among the 19 empirical comparison studies (see page 17 reviewed in this paper is the trend toward designs which in one way or another also dichotomize school settings into "structured" and "unstructured" with the consistent finding that children taught within those models labeled "high structure" tend to show greater cognitive gains. Clearly, this finding is important and its significance does lie within the structure-unstructured classification, but not for the reason that this distinction is helpful in predicting outcomes of instruction. Rather, it masks what is involved in these studies: the comparison of that classical experimental problem, small-group or individual training sessions, with the historically evolved naturalistic classroom whole-group setting. Both educators and the public have long observed that all children do not necessarily learn certain skills or develop certain habits in the naturalistic setting but, there is evidence from research which began at the Iowa Child Welfare Research Station in the '30's that children's behavior can be modified by "training procedures aimed at the direct and purposeful development of skills."[4]

Of the studies under review, ten (Cox, Dickie, DiLorenzo, Erickson, Foster, Harding, Kohlberg, Karnes, Miller-Dyer, Weikart) directly employed small-group training procedures within the rhetoric of "structure." Except for Weikart, the general finding, after preschool experience, was greater

gains within the structured program. In Weikart's study all three treatment groups gained equally with no significant differences between groups; however, the Traditional group included a 90-minute teaching session in the home of each child every other week. Obviously, this falls within the small-group or individual training procedure and seems to confirm the 1963 statement by Sears & Dowley of the "meaning of the small-group training studies":

> The studies cited in this section represented deliberate attempts to modify children's behavior in small-group or individual training sessions, as compared with the natural nursery school classroom which normally contains 15 or more children. The small-group studies were, in effect, attempts to ascertain whether certain changes can be induced under very special conditions of intensive training. The answer here is yes, for the results cited here are positive. . . .[5]

What is needed at the present time is the systematic experimental investigation of the nature of small-group training within the classroom.

That aspect of cognitive development which appears as the singularly most important specific training within the models compared is 'language' training; however, no clear attempts were made to formulate a rationale for either the language-cognition relationships or the assumption that language is in some way a skill amenable to training. Even when language training is not explicitly a treatment, as in the Dickie study which assessed "structured and unstructured methods of language training," predicted language change nevertheless is present as an important assumption by virtue of the types of tests used in the measurement of achievement and intelligence gains. Findings with regards to language training occupy a range from Karnes' finding of no language gain within the Montessori model through positive changes in observed purposeful verbal behavior in the Brainin study.

Pointing to a specific language skill, Dickie's inventoried results of the Bereiter-Engelmann pattern drill found the mean of the structured group slightly higher than the mean of the unstructured group and, what may be of utmost importance, that labelling (a theoretically significant aspect of language development and concept formation) was performed more effectively by initially low-language children under the structured method. Rather than merely concluding from these results that structured language training is somehow more effective with disadvantaged children, the Dickie gains can be interpreted as indicating that labelling is a critical variable and its use differentiates children's language and /or cognitive performance.

A puzzling feature of these empirical studies is the inconsistency of conclusions regarding gains by low socioeconomic status (SES) children in relation to gains by higher SES groups. While Kohlberg found a decrease in I.Q. in a class described as "lower income," both DiLorenzo and Head Start Planned Variation research indicated that there are significantly larger gains in I.Q. for low SES than higher SES children. And Lenrow's longitudinal study found high SES children to have significantly higher scores on I.Q. than low SES children in three different testing periods. What this puts in question is that any given treatment is an absolute, quantifiable entity which acts on all children with equal force and is not itself subject to differences of effect depending upon the entering behavior of the child and the meaning of that treatment to the child, where meaning is taken as the psychological meaning of interest and attitude. It can be imagined that labelling within a language lesson might be novel for some children, show habituation effects on a child already saturated with that competence, or be totally meaningless to a particular child.

Perhaps the most important distinction that arises in the studies is shown in programs which included three-year-olds. Studies by Kohlberg, Karnes, and Harding can be interpreted as showing that classroom intervention is most effective at age three with I.Q. gains of 16 points, 17 points, and 11 points, respectively. This significant age aspect of compensatory programs is an intuitively reasonable finding when we reflect on our natural observation that around age three children seem to show a sudden proficiency and interest in talking. Mothers often report that suddenly he/she is talking all the time and that they note something 'different' about the talking. This unexamined notion of difference might be related to the child's awareness or consciousness of self and language. The larger I.Q. gains reported in programs emphasizing language training may therefore indicate that there is a critical period in the development of language-thought processes which may be enhanced by language training.

A disquieting tendency reflected in the research reports is the use of the ideological sentence[6] in which opinion, together with value and appeal assertions easily con·ound the search for a cause-effect relationship. It is plausible that the content of the two descriptions of method quoted below (from the Brainin study) reveals ideological patterns of argumentation which reflect the researchers' own biases and convictions rather than empirical findings. These excerpts illustrate the quite typical bias with which different models are often described and suggest that what is common to programs is obscured and that the characterization of a method in ideological terminology may affect attitudes towards that method. First, Brainin's description of the Laissez-Faire method:

> One approach we observed was primarily 'laissez-faire' on the part of the teacher. Materials were made available to the children and they approached them as they wished with little or no structure imposed upon their involvement. The teacher's role was primarily custodial (keeping supplies available and in order) and maternal (offering consolation for physical and emotional hurts, patching up quarrels, maintaining discipline) and only rarely instructive. Social interaction between the children themselves was the moving force in this setting, and occasionally a highly organized activity would evolve, initiated by an imaginative child whose leadership was accepted by the group. The teacher would sometimes intervene to assist or further develop the activity. Her contact with the children was primarily during the course of group activity and with individual children in times of special need. The development of purposeful behavior appeared to be fostered least of all by this type of setting.

In contrast, the Teacher-Intervention method:

> In our observations of other approaches, we saw an attempt to achieve this kind of development with varying degrees of success. In the case of the two boys whose behavior was markedly disorganized and frantic we saw how, on the basis of a one-to-one contact with a teacher and a structured and teacher directed classroom situation, they were helped to play and live in a more purposeful way. We also observed how this approach helped the two 'nomadic' boys initially listless and functioning on the periphery of the group, to define their participation and to seek out and accomplish tasks with growing self-satisfaction and more meaningful verbal communication. The security and stimulation of a sustained relationship with one of the teachers helped a boy with emotional problems to adhere to group requirements and to tolerate frustration more easily. It was only then that we were able to observe the high level of persistence and the depth of attention of which he was capable.

Even the names given to the two methods provide an initial explicit appeal since the term "laissez-faire" has widespread negative connotations. A short list of words and phrases extracted from both descriptions points up the ideological terminology with which Brainin reports her findings.

Laissez-Faire	Teacher-Intervention Method
primarily	one-to-one contact with the teacher
were made available	structured and teacher directed classroom situation
they (children) approached them (materials) as they wished	helped to play and live in a more purposeful way
with little or no structure imposed	

primarily custodial
maternal
rarely instructive
occasionally a highly organized activity would evolve
initiated by an imaginative child whose (child) leadership was accepted by the group
would sometimes intervene to assist
her contact was primarily during the course of group activity
the development of purposeful behavior appeared to be fostered least of all by this type of setting

define their participation
seek out and accomplish tasks
growing self-satisfaction
more meaningful verbal communication
security and stimulation of a sustained relationship
helped
adhere
to tolerate frustration more easily
high level of persistence
depth of attention

Despite the intent of some writers, to be more exact, comparison studies have tended to use the term 'model' in such a global way as to raise the question of meaningfulness in concluding that any model A is more or less effective than another model B. The term is used to cover such a variety of aspects that one wants to ask if there is any good reason for assuming the appropriateness of comparison on such a holistic level. For example, Weikart, in "Relation of Curriculum, Teaching, and Learning in Preschool Education,"[7] uses terms interchangeably without clarification as to what criterion determines such undifferentiated use:

education	experiences	intervention
approach	climates	ideas
theory	environments	programs
method	groups	curriculum
treatment	waves	concerns
		model

In addition, for Weikart, a model is "particular," and "specific," and "general," and "mixed." Further, a model may be "directed" at clearly defined educational goals or may "have" clearly defined educational objectives. It may "assume" that everything can be taught by the careful control of the student response while, at the same time, it does "not make a priori assumption about the limitations of individual children." Also, a model may "subscribe to specific theoretical goals" but "depend upon the teacher

to create the exact curriculum (model) in which the child participates," while at the same time "accepting the reponsibility of developing the capacity of the child to reason and to recognize the relationship of his own action to what is happening about him," and may even be "oriented towards organizing and utilizing the people involved. .." Hopefully, a more precise use of terms could dispel the unwarranted belief that it is a "model" which is "implemented." A less contradictory variety of expressions defining goals and methods of implementation would clarify research designs and program comparisons.

A general finding of comparison studies which is put as little or no differential effect for a number of very different treatments brings out problems in educator's experimental prediction and explanations of program outcomes. Examination of the comparison tables (see page 19) which shows (1) what was observed for data, (2) what was collected as data, and (3) the findings, reveals difficulties in determining on what basis a claim of relationship can be made. To begin with, we can ask "What is the phenomenon to be accounted for, to be explained?" Suppose it is, as often stated, intellectual development. While the concept of "development of intelligence" within child psychology and education has long been attributed to the influence of Darwin and the theory of evolution, this vague notion has, at least in part and to its credit, exposed fundamental questions of how we become differentially "intelligent," and scientists, interested in more than the data of unexamined experience, have given explanations of the common-sense "smarter than" in ways that presuppose the interaction of "heredity" and "environment." In the research studies, "environment" has been loosely interpreted as the setting provided by the model. But on

what basis can we accept several additional correct answers on the Stanford-Binet intelligence test as evidence that we have "observed" "intellectual development" caused by a "model"-child interaction? Noting the change in I.Q. points is like reading degree changes on a thermometer. What can we say has been "explained?"

According to Hunt,

> As early as 1895, Binet and Henri set forth what have become two of the principal problems of differential psychology, namely, to determine the nature and extent of individual differences in psychological processes and to discover the interrelationsnips of mental processes within the individual.[8]

Therefore, the change in I.Q. reflects (1) a change in individual differences with (perhaps) a particular school setting and (2) (perhaps) a changed interrelationship of mental processes within the individual. To explain this change, this phenomenon, involves precise theoretical and observational techniques which are based on individual scores and not on group data. What is so obviously missing in comparison studies, is a theoretical basis for predicting cognitive changes together with clear, precise formulation of the relationship among what is being explained and what is being observed together with what is to count as evidence.

For instance, what reason can we give for positing the relationship of cognitive gains (what is to be explained), parental attitudes (what is to be observed) with what counts as evidence (I.Q. gains)? If we take each "model" to represent a different theory, the result, little or no differential effect, can be taken to imply that the models and thus the theories are really not different. There is surely something uncomfortable in the assumption that we test models (theories) by comparing them in a

competitive way. The more fruitful, if not more correct, procedure would be to test each theoretical model by manipulation of various parameters within the model. Thus, in testing the Bereiter "theory' or "model" parameters such as small group vs. whole group, age, SES, pattern drill would be systematically varied for many classrooms. Each model would proceed to test its particular theory for prediction of cognitive gains. Then, the important question, acceptance of a model, would be decided on the basis of such criteria as correct prediction of cognitive gains and educational and humanistic values. What is imperative is that the theory, the model, be developed by progressive observation and correction.

In pointing out trends and problems in comparison studies of early childhood education models, this essay has not attempted the more usual exploration of inferences based on a precise accounting of statistical results. The task, rather, has been to raise some more fundamental questions which might help clarify what we are up to in early childhood education research when we, as responsible educators, propose the generalized notion of a program effecting cognitive change in a young child.

Notes

1. See, J. McVicker Hunt. 1964. The psychological basis for using preschool enrichment as an antidote for cultural deprivation. Merrill-Palmer Quarterly, 10(3), 209-248.

2. Pauline S. Sears & Edith M. Dowley. 1963. Research on teaching in the nursery school. In N. L. Gage (Ed.), Handbook of Research on Teaching. Chicago: Rand McNally & Company. (822) 814-864

3. A survey (Parker and Ambron 1972) conducted by The Office of Child Development revealed that over 200 preschool curricula exist in various stages of development.

4. Pauline S. Sears & Edith M. Dowley, op. cit., 841.

5. Ibid., 845.

6. For a discussion of objective assessment of ideologies, see Arne Naess. 1956. Democracy, Ideology and Objectivity. Oxford: Basil Blackwell.

7. J. McVicker Hunt. 1961. Intelligence and Experience. New York: The Ronald Press Company. p. 12.

8. David P. Weikart. 1972. Relationship of curriculum, teaching, and learning in preschool education. In Julian C. Stanley (Ed.), Preschool Programs for the Disadvantaged. Baltimore: The Johns Hopkins University Press.

Qualitative Comparative Studies

Courtney Cazden. Some Questions for Research in Early Childhood Education. 1972
1. Carl Bereiter. Academic Preschool for Disadvantaged Children
2. David Weikart. Ypsilanti Perry Preschool Project
3. Oralie McAfee. An Integrated Approach
4. Todd Risley. Spontaneous Language
5. Marion Blank. The Treatment of Personality Variables in a Preschool Cognitive Program

Ira Gordon. An Instructional Theory Approach to the Analysis of Selected Early Childhood Programs. 1972.
1. University of Arizona
2. Bank Street College of Education
3. Educational Development Corporation
4. Engelmann-Becker
5. Far West Laboratory
6. University of Florida

Eleanor Maccoby & Miriam Zellner. Experiments in Primary Education. 1970.
1. EDC Approach
2. Engelmann-Becker Program
3. The Behavior Analysis Program
4. The Bank Street Program
5. The Florida Project
6. The Instructional Games Program
7. The Tucson Early Education Model
8. The Responsive Model
9. The Primary Education Project
10. The Cognitively Oriented Approach

Constance Kamii. Evaluation of Learning in Preschool Education: Socio-Emotional, Perceptual Motor, Cognitive Development, 1971.
1. Traditional Nursery School
2. Cognitively Oriented Preschool
   a. DARCEE Project
   b. Bereiter-Engelmann Program
3. Piagetian Cognitively Oriented Preschool

Margaret Lay and John Dopyera. Analysis of Early Childhood Programs: A Search for Comparative Dimensions
1. Bereiter-Engelmann
2. Montessori
3. Syracuse University Early Childhood Education Center
4. New Nursery School
5. DARCEE
6. Britain's Primary Schools
7. Institute for Developmental Studies
8. Responsive Environment
9. Florida Parent Education Project
10. Elliott Pearson Nursery School
11. Sprigle "Learning to Learn"

Rochelle Selbert Mayer. A Comparative Analysis of Preschool Curriculum Models. 1971.

1. Bereiter-Engelmann
2. Montessori
3. Traditional
4. Open

Ronald K. Parker and Mary C. Day. Comparisons of Preschool Curricula. 1972.

1. Kamii's Piagetian Preschool
2. Weikart's Unit-Based Program
3. Hooper's Organismic-Developmental
4. Montessori
5. Glen Nimnicht
6. Robison
7. Karnes
8. Bereiter
9. Miller/Camp
10. Nedler
11. Banta
12. Whitney/Parker
13. Shaefer/Aaronson
14. Frank Palmer

Susan Stodolsky. Defining Treatment and Outcome in ECE. 1971.

1. Structured
   a. Bereiter-Engelmann
   b. Bushell Behavior Modification
   c. Karnes
   d. DARCEE
   e. Perry Preschool
2. Traditional, Child-Centered, or Discovery
   a. Bank Street
   b. EDC

Empirical Comparison Studies

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Implementation of Planned Variation in Head Start: Preliminary Evaluations of Planned Variation in Head Start According to Follow Through Approaches (1969-70) Interim Report: First Year of Evaluation, Part II. 1971. (OCD). Menlo Park, California: Stanford Research Institute. PS 004 916.

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Karnes, Merle B. 1968. A Research Program to Determine the Effects of Various Preschool Intervention Programs on the Development of Disadvantaged Children and the Strategic Age for Such Intervention. Paper presented at the meeting of the American Educational Research Association, Chicago. ED 017 319.

Table 1

(continued)

Models Compared	Sources of Data
1. Traditional Montessori (Cox, 1968)	Stanford-Binet, PPVT Caldwell Preschool Inventory Maryland Parent Attitude Survey Minn. Teacher Attitude Inventory
2. Structured Language Unstructured Language (Dickie, 1968)	Expressive Vocabulary Inventory Children's Auditory Discrim. Inv. Auditory-Vocal Assoc. Subtest (ITPA) Vocal Encoding Subtest (ITPA) Stanford-Binet, PPVT
3. Cognitive: High, Moderate Traditional: Low, Moderate (Types of structure) (DiLorenzo, 1969)	Stanford-Binet, PPVT, ITPA Learner Self Concept Metropolitan Readiness Test Metropolitan Achievement Tests Primary I, Upper Pri, Reading
4. Bereiter-Engelman Preschool- & Kindergarten B-E Prescchol, Enrichment K Enrichment Preschool, K Enrichment Preschool, B-E K (Erickson et al, 1969)	Stanford-Binet, ITPA Wide Range Achievement Tests Teacher Ratings of Language & Speech Skills
5. Engelmann-Becker Nimnicht Responsive (Feeney, 1970)	Banta' Cincinnati Autonomy Test Battery Curiosity Box Dog and Bone (Creativity) Observations
6. High Structure Low Structure (Foster, 1966)	Stanford-Binet Children's Individual Test of Creativity (CITOC)

Table 1

(continued)

Major Findings

Little relationship between teachers attitudes and children's achievement
Maternal attitudes: No significant effect on children's achievement
Disadvantaged & middle class children performed better on achievement tests in Montessori programs

Only significant difference involved labelling:Structured more effective
All groups made significant gains in language development

PPVT: No differences among programs
Self concept: No differences, all programs ineffective in enhancing self concept
MAT Primary I: Children with preschool higher than those without
MAT Upper Primary Reading: Earlier significant differences washed out after 3 years
ITPA: Cognitive programs more successful at higher levels of the ITPA

End of preschool: Stanford-Binet gains: B-E Enrichment control
ITPA: Gains favored B-E, Enrichment, but not significant
End of kindergarten: Regular Kindergarten (achievement) B-E Enrichment control PS
B-E Kindergarten (achievement) B-E Enrichment, control, but not significant
Children [illegible] 2 years B-E did not differ from those with B-E PS & Regular K
Children from Enrichment PS who went into B-E Kindergarten did not differ from those in regular kindergarten
Control children (no preschool) in B-E Kindergarten performed significantly higher than those in Enrichment kindergarten

Curiosity Box: Children in Responsive model scored higher
No differences between models on creativity, free play observation, classroom observation schedules

CITOC: Children in high structure program made greater gains on total verbal score
Stanford-Binet: Children in both programs made gains

Table 1

(continued)

Models Compared	Sources of Data
7. Head Start Experimental Nursery School (Harding, 1966)	Goodenough Draw-A-Man Draw-A-Woman Stanford-Binet, PPVT Metropolitan Readiness Test
8. Pre-Academic: Bushell Engelmann-Becker Cognitive Discovery: Gordon, Tucson, Weikart, Nimnicht Discovery-oriented: EDC, Bank Street Unsponsored Head Start (Stanford Research Inst., 1971)	NYU Early Childhood Inventory Preschool Inventory Stanford-Binet Motor Inhibition Eight Block Sort Hertzig-Birch Measures of Spontaneous Extension & Passivity Substitution
9. Montessori Regular Preschool (Jensen & Kohlberg, 1966)	Stanford-Binet Ratings of test behavior Goodenough Draw-A-Man Length Conservation (Piaget) Egocentrism Test (Piaget) Teachers' ratings of classroom behavior
10. Traditional(T) Karnes Ameliorative(A) Engelmann-Becker(E-B) Montessori(M) Community Integrated(CI) (Karnes, 1968)	Stanford-Binet ITPA Metropolitan Readiness Test
11. Traditional(T) Ameliorative(A) Direct Verbal(DV) (Karnes et al, 1968)	Stanford-Binet, ITPA Metropolitan Readiness Test Frostig Test of Visual Perception California Achievement Tests

Table 1
(continued)

Major Findings

Both Head Start and Nursery School children gained in verbal ability
Metropolitan Readiness Test: No differences

On all measures, Planned Variation sponsored programs achieved greater gains than regular Head Start programs
No one program type was significantly higher in the end in pre-academic or general cognitive development

Stanford-Binet: No differences
Goodenough Draw-A-Man: No differences (test considered unstable)
Piagetian tests: No differences between Montessori and regular class

Stanford-Binet: No pretest differences; all groups except CI & M significantly higher at posttest
ITPA: T & A significantly higher on pretest; all significantly higher on posttest (over pretest). E-B, T, A significantly higher than M & CI

Stanford-Binet: A & DV superior after preschool experience
At the end of the third year, magnitude of losses experienced by DV resulted in no differences among groups; all made gains

(continued)

Table 1

Models Compared	Sources of Data
12. Teacher Structured Personal-Social Katz, 1968	Observation of children Child Behavior Survey Instrument (revised)
13. Child Development(CD) Structured(S) (Kohn, 1967)	Observation of classroom environment Observation of children
14. Divergent(D) Convergent(C) Mixed(M) (Lenrow, 1968)	Stanford-Binet Draw-A-Man
15. Bereiter-Engelmann DARCEE Montessori Traditional Miller & Dyer, 1970)	Stanford-Binet, Preschool Inven. Quick Picture Vocab. Test Curiosity Box, Replacement Puz. Dog & Bone, Face shhet of Binet Embedded Figures Wepman Auditory Disc. Test Parallel Sentence Production Expressive Vocab Inventory Basic Concept Inventory Arithmetic Test, PPVT
16. Preschool: Bereiter-Engelmann DARCEE Montessori Traditional Kindergarten: Follow Through Regular (Miller & Dyer, 1971)	Stanford-Binet, Preschool Inven. Curiosity Box, Replacement Puz. Dog & Bone, Basic Concept Inv. Embedded Figures, Parallel Sent. Production Arithmetic Test

Table 1

(continued)

Major Findings

Children in Personal-Social maintained initial level of task absorption, decreased slightly in uneasiness, maintained frequency of cognitive behavior, & gained in satisfaction
Children in Teacher Structured decreased slightly in task absorption, increased in non-task involved behavior, remained uneasy, & failed to gain in satisfaction
(Author commented that Teacher Structured model failed to be applied correctly)

Structuring of goal CD S
Stringency of participation S CD
Children's freedom to choose CD S
Teacher assistance asked for & given S CD
Child-child assistance CD S

C made significant gains on logical operations
No significant IQ gains between end of preschool and end of first grade

Stanford-BInet: B-E & DARCEE significantly higher than control; B-E was significantly higher than Traditional
Preschool Inventory: Experimental program gained significantly more than control on Spring test. DARCEE, B-E, Montessori scored higher than controls.

Follow Through kindergarten superior to regular kindergarten in Preschool Inventory, a measure of academic achievement, arithmetic, and embedded figures
Regular kindergarten was superior in persistance

TAble 1

(Continued)

Models Compared	Sources of Data
17. Traditional Cognitive Task Oriented (Weikart, 1969)	Stanford-Binet, PPVT Leiter International Performance
18. Traditional Cognitive Task Oriented (Weikart & Wiegerink, 1968)	Stanford-Binet, PPVT Leiter International Performance

Table 1

(continued)

Major Findings

All groups gained equally on Stanford-Binet
Groups did not differ on the Leiter
Groups did not differ on the PPVT

IQ gains for all groups, including control
PPVT: Scores obtained by children enrolled in different curricula directly related to amount of teacher initiated language training
Initial results support contention that structured curricula produce greater intellectual performance gains than a Traditional program or no program at all

Karnes, Merle B. and others. 1968. A Longitudinal Study of Disadvantaged Children who Participated in Three Different Preschool Programs. (OEO). Paper presented at the meeting of the American Educational Research Association, Los Angeles. ED 036 338.

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Kohn, Martin. 1967. Analysis of Two Kindergarten Settings. In Arno A. Ballach (Ed.), Theory and Research in Teaching. New York, New York: Teachers College Press, Columbia University.

Lenrow, Peter B. 1968. Preschool Socialization and the Development of Competence: An Exploratory Research Project. (Office of Compensatory Education, California State Department of Education). Berkeley, California: University of California.

Miller, Louise B. and Dyer, Jean L. 1970. Experimental Variation of Head Start Curricula: A Comparison of Current Approaches. Annual Progress Report. June 1, 1969-May 31, 1970. (OEO). Louisville, Kentucky: University of Louisville. ED 045 196.

Miller, Louise B. and Dyer, Jean L. 1971. Two Kinds of Kindergarten After Four Types of Head Start. (OEO). National Institute of Child Health and Human Development. Louisville, Kentucky: University of Louisville. ED 050 824.

Weikart, David P. 1969. Comparative Study of Three Preschool Curricula. (DHEW/OE). Paper presented at the meeting of the Society for Research in Child Development, Santa Monica. ED 042 484.

Weikart, David P. and Weigarink, R. 1968. Initial Results of a Comparative Preschool Curriculum Project. Proceedings of the 76th Annual Convention of the American Psychological Association, San Francisco. PS 000 617.

Table 2

Correspondence between Variables Studied and Data Collected

Study Number*	Variables Studied	Data Collected
1.	Maternal attitudes Teacher attitudes Type of nursery school training of teacher	Stanford-Binet, PPVT Preschool Inventory Maryland Parent Attitude Inventory Minnesota Teacher Attitude Inventory
2.	Structured method of language training Unstructured method of language training	Expressive Vocabulary Inventory Children's Auditory Discrim. Inven. Auditory-Vocal Ass. Subtest (ITPA) Vocal Encoding Subtest (ITPA) PPVT, Stanford-Binet
3.	Increased capacity to learn Improved social development Better self concept Increased motor development More positive attitudes toward school	Stanford-Binet, PPVT, ITPA Learner Self Concept Metropolitan Readiness Test Metropolitan Achievement tests, Primary I, Upper Primary Reading
4.	Cognitive abilities Social adjustment Teacher attitude toward program	Stanford-Binet, ITPA Wide Range Achievement Tests Teacher ratings of language & speech skills
5.	Exploratory behavior Innovative behavior Approach to new materials	Banta's Cincinnati Autonomy Test Battery Curiosity Box Dog and Bone
6.	General intelligence Creativity	Stanford-Binet Children's Individual Test of Creativity (CITOC)
7.	"Differential effects"	Goodenough Draw-A-Man, Draw-A-Woman Stanford-Binet, PPVT Metropolitan Readiness Test
8.	"Implementation of program	NYU Early Childhood Inventory Preschool Inventory Stanford-Binet, Motor Inhibition Eight Block Sort Hertzig-Birch Measures of Spontaneous Extension & Passivity Substitution

*Refer to list of references for information on these studies.

Table 2
(continued)

Study Number	Variables Studied	Data Collected
9.	Changes in intellectual behavior Social behavior Attitudes and social interaction of blacks and whites	Stanford-Binet Ratings of test behavior Goodenough-Harris Draw-A-Man Test Length Conservation Test Egocentrism Test Teachers' ratings of classroom behavior
10.	Intellectual development	Stanford-Binet, ITPA Metropolitan Readiness Test
11.	Intellectual development	Stanford-Binet, ITPA Frostig Test of Visual Perception Metropolitan Readiness Test California Achievement Tests
12.	Task involvement Cognitive behavior Motivation for learning	Observations of children Child Behavior Survey Instrument (revised)
13.	Classroom setting	Observation of classroom to describe setting in which child functioned Observation of children
14.	Intellectual competence Confidence Initiative in exploratory activity Relationships among learning conditions in family	Stanford-Binet Draw-A-Man
15.	Cognitive variables Motivational & social variables Perceptual variables Specific skills	Stanford-Binet, Preschool Inventory Quick Picture Vocabulary Test Embedded Figures, Curiosity Box Wepman Auditory Disc. Test Replacement Puzzle, Dog & Bone Test Face sheet of Binet, PPVT Parallel Sentence Production Expressive Vocab. Inventory Basic Concept Inventory Arithmetic Test
16.	Cognitive variables Motivational & social variables Perceptual variables Specific skills	Stanford-Binet, Preschool Inventory Curiosity Box, Replacement Puzzle Dog & Bone, Basic Concept Inventory Embedded Figures, Arithmetic Test Parallel Sentence Production

Table 2
(continued)

Study Number	Variables Studied	Data Collected
17.	Intellectual competence	Stanford-Binet, PPVT Leiter International Performance
18.	Intellectual competence	Stanford-Binet, PPVT Leiter International Performance

Table 3

PUPIL CHARACTERISTICS AND PROGRAM EMPHASES

Variables	Programs					
	Arizona	Bank Street	EDC	E-B	FWL	Florida PE
Bio-Social						
Age in years.....	4-9	4-9	4-9	4-9	3-9	3-9 & adult
Sex.....						x
Social class.....	x			x	x	x
Ethnic group.....	x				x	x
Language group.....	x				x	x
Physical maturity...					x	
Psychological Cognitive						
Intellectual development	c	c			c	c
Academic achievement...	c	c		c	c	c
Language development...	c	c	c	c	c	c
Sensory development ...			c		c	
Concept development ...	c	c	c		c	c
Problem-solving skill..	c	c	c		c	c
Questioning, challenging, searching.....	c		c			p
Affective						
Self-concept.....	c	c	c		c	c,p
Initiative, self-direction	c	c	c			c,p
Imagination, curiosity.			c			c,p
Respect for others.....	c	c	c			c,p
Achievement motivation.	c					c,p
Teaching Skill.....						p
Socialization Skill.....	c	c				

x - Program takes this variable into account in its material and procedures.
c - Program seeks change in child.
p - Program seeks change in parent.

Table 4

CLASSROOM INSTRUCTIONAL SITUATION
VARIABLES AND PROGRAM EMPHASES

Variables	Programs					
	Arizona	Bank Street	EDC	E-B	FWL	Florida PE
Classroom Organization						
Amount of time.....				180 scs.		
Space.....						
Class or group size...						
Pupil-teacher ratio...						
Use of aide, assistants	D	B	X	X	X	B
Specified teamwork, roles.....		B				B
Free choice of activities	B		B		B	
Flexible, small groups	B	B	B		B	D
One-to-one teaching..	B	B			B	B
Variety of groupings.			B		B	D
Learning centers.....	B	B			X	
Individual activities		B	B		B	
Schedule is sequenced		B		B	B	
Adult-led, small groups	B	B		B		B
Materials						
Kits.....	B					
Workbooks.....	B			B		
Media, autotellic...	D				B	
Problem-solving games, puzzles.....		X	B		B	D
Library.....	B	B	B			
Representation of expressive acts.....	D	D	B			
Individual tasks....						B
Material is sequenced		B		B	B	D
Teacher Instructional Role, Behavior						
Sensitive observer...	B	B	B			D
Positive social reinforcer.....	B			B		
Initiator.....	B				B	D,P
Responder to child...	B				B	D
Creator, experimenter		D	B			D,P
Planner of learning episodes.....	B	B			B	B
Structure of activities	B	B				D
Developer of learning tasks					P	B,D,P

Variables	Programs Arizona	Bank Street	EDC	E-B	FWL	Florida PE
Asker of child's feelings.....		B				D,P
Asker for child's ideas, questions.	B	B				B,P
Modeler for child..	B			B		
Giver of correct answers, leader..				B		
Pace setter.....				B		
Teacher Management Role Role Behavior						
Planning Time.....	B	B				
Structure of environment.....	B		B		B	
Responsible decision maker.....			B			B,P
Limit setter.....	B	B				
Transition planner.		B				
Team manager.....		B				B
Teacher Personality						
Supportive.....	B	B			B	P

B - Basic to program.
X - Exists, but not critical; individual.
D - not required but desirable.
P - Parent as teacher.
* - Teacher not to improvise.